U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office
Species Account
BUTTE COUNTY MEADOWFOAM
Limnanthes floccose ssp. california

CLASSIFICATION: ENDANGERED
Federal Register Notice 57:24192; June 8, 1992
http://ecos.fws.gov/docs/federal_register/fr2067.pdf (865 KB)

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STATE LISTING STATUS AND CNPS CODE:
This species was listed as endangered by the California Department of Fish and Game in February 1982. The California Native Plant Society has placed it on List 1B (rare or endangered throughout its range).

CRITICAL HABITAT: Originally designated in Federal Register 68:46683; August 6, 2003.

The designation was revised in 70:46923; August 11, 2005.

Species by unit designations were published in 71:7117; February 10, 2006.
www.fws.gov/policy/library/2006/06-1080.html

www.fws.gov/policy/library/2006/06-1080.pdf (6.6 MB)

RECOVERY PLAN: Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon; December 15, 2005.
http://www.fws.gov/sacramento/es/recovery_plans/vp_recovery_plan_links.htm

5-YEAR REVIEW: Completed
http://ecos.fws.gov/docs/five_year_review/doc1939.pdf

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DESCRIPTION
Butte County meadowfoam is a densely pubescent (hairy), winter annual herb belonging to the false mermaid family (Limnanthaceae). It has white flowers with five petals. The petals form a cup. This is a way to tell that it's not some other meadowfoam.

There are dark yellow veins at the base of each of the petals. The flowers are quite small. Petals are 8-10 mm long (About 1/3 inch).

The stems, which are up to 25 centimeters (9.8

inches) long, generally lie flat on the ground with the tips curved upward. The alternate leaves are pinnately (like a feather) compound, up to 8 centimeters (3.1 inches) long. They consist of 5 to 11 leaflets on a long petiole. The individual leaflets are approximately 1 centimeter (0.4 inch) long and vary from narrow to egg-shaped. Their margins may be smooth, toothed, or lobed.

Seeds that do not germinate in the first year following its production may still be viable. Seed dormancy also would explain population fluctuations of up to two orders of magnitude between years. The seedlings can tolerate short periods of submergence. They develop into rosettes, which do not begin producing flowering stems immediately. Flowering typically begins in February, reaches peak flowering in March, and may continue into April if conditions are suitable.

See Hickman (1993) in General Information about California Plants, below, for a more detailed description of the species.

REPRODUCTION: Floral adaptations allow for cross-pollination by insects, which are attracted by the large flowers and production of nectar. But self-pollination mechanisms take over to ensure seed set if insect pollination is unsuccessful.

VERNAL POOLS:

Vernal pools are a unique kind of wetland ecosystem. Central to their distinctive ecology is their ephemeral nature. Vernal pools fill with water temporarily, typically during the winter and spring, and then disappear until the next rainy season.

In California, where extensive areas of vernal pool habitat developed over a long geological timeframe, unique suites of plants and animals have evolved that are specially adapted to the unusual conditions of vernal pools. Fish and other predators are among species that have been excluded evolutionarily byte annual filling and drying cycles of vernal pools.

The prolonged annual dry phase of the vernal pool ecosystem also has prevented the establishment of plant species typical of more permanent wetland ecosystems.

DISTRIBUTION

Butte County meadowfoam occurs in three types of seasonal wetland habitats: along the edges of vernal pools and ephemeral streams, and occasionally around the edges of isolated vernal pools. It generally occurs on level to gently sloping terrain on poorly drained soils with shallow soil layers impermeable to water infiltration. It thrives in waterlogged soils and tolerates periodic submergence.

The species is restricted to a narrow 25-mile strip along the eastern flank of the Sacramento Valley from central Butte County to the northern portion of the City of Chico. The range has not changed significantly from historical times, but the number of populations, the area occupied, and the amount of available habitat within the range has declined significantly in the last 30 years.

Although never extensive in range, Butte County meadowfoam has been significantly reduced and fragmented by development in the Chico area. Butte County meadowfoam distribution is highly fragmented, with populations clustered in central Butte County near the type locality and in and near the City of Chico.

U.S. Geological Survey 7 ½ Minute Quads: Shippee (576C) 3912156, Oroville (576D) 3912155, Chico (577A) 3912167, Nord (593C) 3912178, Richardson Springs (593D) 3912177.

THREATS

All remaining known populations of Butte County Meadowfoam are subject to urban development, airport maintenance activities, conversion of agricultural lands to other uses, and/or road widening or realignment.

Protecting the watershed that contributes runoff to meadowfoam habitat is required to ensure the continuation of the moisture regime of vernal pools, discourage competition by aggressive upland species and maintain Butte County meadowfoam populations.

REFERENCES FOR ADDITIONAL INFORMATION

General references about California plants
www.fws.gov/sacramento/es/plant_spp_accts/plant_references.htm

There is a web page about this species aimed at 4th – 6th grade students.
http://www.fws.gov/sacramento/es/plant_spp_accts/butte_county_meadowfoam_kf.htm

Dole, J. A. and M. Sun. 1992. Field and genetic survey of the endangered Butte County meadowfoam - *Limnanthes floccosa* subsp. *californica* (Limnanthaceae). Cons. Biol. 6:549-558.

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http://www.fws.gov/sacramento/es/plant_spp_accts/butte_county_meadowfoam_kf.htm

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